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Jeremy John Hawkes

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EXAMINER

COLEMAN, RYAN L

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/530,131	<b>Applicant(s)</b> HAWKES ET AL.	
	<b>Examiner</b> RYAN COLEMAN	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-11 and 14 is/are pending in the application.
- 4a) Of the above claim(s) 9-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8 and 14 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Applicant's amendments filed September 10, 2009 are acknowledged. Claims 3, 12, and 13 have been cancelled. Claims 1, 2, 4-11, and 14 are pending, and claims 9-11 have been withdrawn.

#### ***Claim Objections***

2. Claim 4 depends on claim 3, but claim 3 is a cancelled claim. For purposes of examination, it was presumed that claim 4 was intended to depend from claim 1.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4, 5, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,743,361 to Schram.

5. With regard to claim 1, Schram teaches an apparatus for moving particles entrained in a first liquid to a second liquid that includes a conduit defined by a first wall with a window (item 310 in Figure 11) and a second, opposite wall with a window (item 308 in Figure 11; Col. 18, line 61 to Col. 19, line 66). The conduit is in communication with a first inlet (item 316 in Figure 11) and a first outlet (item 320 in Figure 11) for a

liquid (applicant's *first fluid*) that comes from a first container (item 324 in Figure 11). As shown in Figure 11, the first wall with window 310 comprises a second inlet (item 318 in Figure 11) and a second outlet (item 322 in Figure 11) for a liquid (applicant's *second fluid*; Col. 18, line 61 to Col. 19, line 58). Schram teaches using ultrasonic transducers (items 304 and 306) to generate a standing sound wave having a pressure node disposed within the conduit (Col. 18, line 61 to Col. 19, line 31; Col. 17, line 52 to Col. 18, line 28).

6. With regard to claim 2, the apparatus of Schram minimizes mixing between the two liquids because Schram teaches having guide vanes (item 317 in Figure 11) that ensure a parallel streamline flow of liquid through the first inlet as the second liquid enters through the second inlet (Col. 19, 12-31). When liquids enter the conduit at appropriate velocities, the apparatus of Schram is considered to be structurally capable of having the liquids contact each other with laminar flow.

7. With regard to claim 4, as discussed in the objection to claim 4, it is presumed that claim 4 was intended to depend from claim 1. As shown in Schram's Figure 11, the first inlet and the first outlet are orthogonal to the second inlet and the second outlet.

8. With regard to claim 5, the limitation of claim 5 that specifies that the standing wave's pressure node is centrally disposed along the longitudinal conduit specifies intended use of the apparatus (MPEP 2114), and therefore, the limitation is not given patentable weight. Schram teaches that the apparatus's ultrasonic transducers are capable of generating a drifting standing wave, and therefore, the apparatus is

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considered to be structurally capable of having a pressure node centrally disposed along the conduit's longitudinal length.

9. With regard to claim 14, as shown in Schram's Figure 11, the first inlet and the first outlet communicate with the second wall, and the second inlet and the second outlet communicate with the first wall (Figure 11).

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,743,361 to Schram in view of U.S. Patent No. 6,216,538 to Yasuda et al. (hereafter referred to as "Yasuda").

14. With regard to claim 6, the teachings of Schram are discussed in the anticipation rejection of claim 1. Schram teaches constructing the walls of the apparatus with polymethylmethacrylate, which, as taught by Schram, is a material that reflects sound waves (Col. 17, 52-59; Col. 18, 14-18; Col. 18, line 67 to Col. 19, line 6). Therefore, the second wall is considered to be adapted to reflect sound waves coming from the direction of the first side wall.

15. Schram does not teach that the first wall of the apparatus is capable of generating the standing sound wave because, as shown in Schram's Figure 11, the transducer 306 is spaced apart from the first wall.

16. Yasuda teaches an apparatus for using standing acoustic waves (shown as item 55 in Figure 19A) to move and concentrate particles (item 58 in Figure 19A) within a liquid flow (Col. 20, 1-33; Figures 19A and 19B). Yasuda teaches using ultrasonic generators that are attached to the walls of the tube through which the particle-containing liquid flows, and as taught by Yasuda, the attached generators produce the standing acoustic waves that move the particles (Col. 20, 34-63).

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17. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Schram such that the ultrasonic transducer 306 is attached to the first wall (MPEP 2143, Rationale A). One of ordinary skill in the art could have used known techniques to perform the modification, and the results would have been predictable to one of ordinary skill in the art. The motivation for performing the modification was provided by Yasuda, who taught that the movement of particles within a flowing liquid can be controlled by generating standing sound waves from generators that are attached to the walls of the container through the particle-containing liquid flows.

18. With regard to claim 7, Schram teaches using barium titanate, a piezoceramic material, as the piezoelectric material of transducer 306 (Col. 18, 1-7; Col. 18, line 67 to Col. 19, line 6), and in the modified system of Schram in view of Yasuda, since the transducer 306 is part of the first wall's structure, the first wall comprises a piezoceramic material.

19. With regard to claim 8, in the apparatus of Schram in view of Yasuda, Schram teaches that the transducers 304 and 306 are both associated with a source of alternating potential such that the transducers can produce acoustic waves (Col. 18, 1-7; Col. 18, line 67 to Col. 19, line 6).

### ***Response to Arguments***

20. Applicant's arguments with respect to claims 1, 2, 4-8, and 14 have been considered but are moot in view of the new ground(s) of rejection. Applicant's

amendments filed September 10, 2009 overcame the rejections presented in the examiner's non-final rejection, and new rejections have been presented in this office action.

### ***Conclusion***

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

22. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN COLEMAN whose telephone number is (571)270-7376. The examiner can normally be reached on Monday-Friday, 9-5.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone



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number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RLC/

Ryan L. Coleman

Patent Examiner, Art Unit 1792

December 3, 2009

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 1792